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ABSTRACT

The Task Force on Space for Health Sciences is one of four task forces established by the Committee on Capital Financing of the Council of Ontario Universities to work toward the development of a capital formula that would define space needs and building costs for Ontario universities. Each task force has a particular assignment related to the collection, examination, and selection of data to be presented in a formula that would (1) reflect the present space needs at each Ontario university; (2) predict future space needs in the light of changes in enrollment and curricula; and (3) provide for an equitable distribution of capital funds to these universities. The various disciplines for which space needs are estimated include medicine, rehabilitation therapy, art as applied to medicine, optometry, dentistry, pharmacy, nursing, and hygiene and public health. (Author/HS)

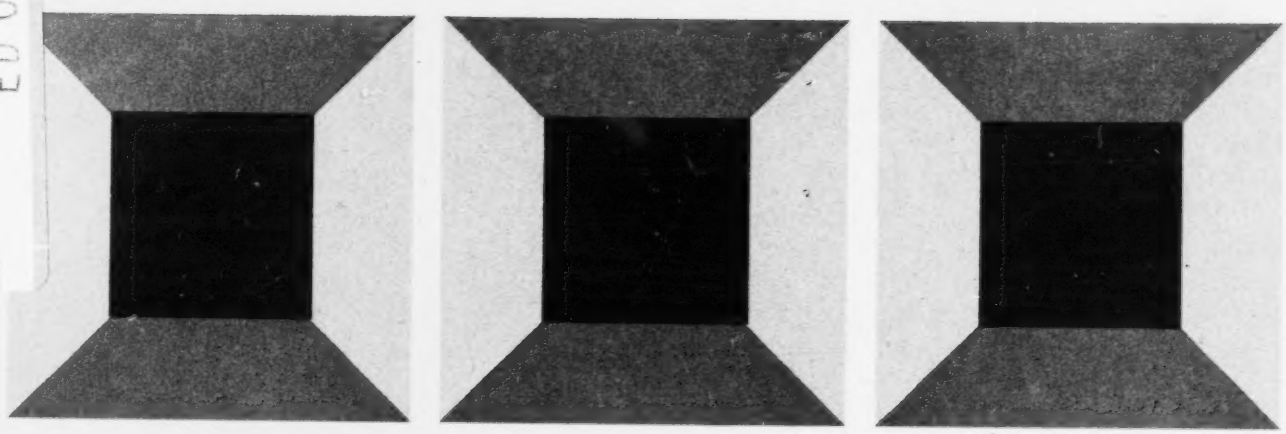
Council of Ontario Universities
Conseil des Universités de l'Ontario

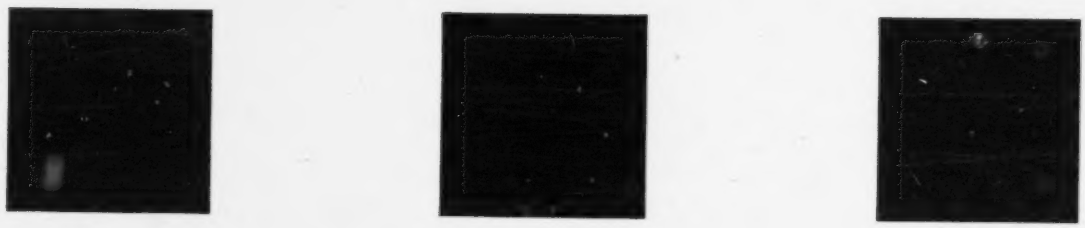
Building Blocks

Background Studies on the Development of a Capital Formula for Ontario

VOLUME 3

Report of the Task Force SPACE FOR HEALTH SCIENCES





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REPORT OF THE

TASK FORCE - SPACE FOR HEALTH SCIENCES

Council of Ontario Universities
Conseil des Universités de l'Ontario

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1. INTRODUCTION

The Task Force - Space for Health Sciences is one of four task forces established by the Committee on Capital Financing of the Council of Ontario Universities in 1971 to work toward the development of a capital formula that would define space needs and building costs for Ontario universities. Each task force had a particular assignment related to the collection, examination, and selection of data to be presented in a formula that would

a. reflect the present space needs at each Ontario university,
b. predict future space needs in the light of changes in enrolment and curricula, and
c. provide for an equitable distribution of capital funds to these universities.

One task force was to carry out an examination of unit building costs for both university and non-university buildings, for different kinds of construction, and for different kinds of space. A second task force was to carry out a general study of space and its utilization. It was to work toward the development of space standards based on the most appropriate measures to which these standards might be related, as for example space per student, per faculty member, etc. A third task force was to concentrate on the space needs of faculties and colleges of education. A fourth task force was to carry out a similar study dealing with space for the health sciences.

For a more detailed discussion of the events leading to the formation of these task forces, the reader is referred to the Report of the Task Force - Space and Utilization entitled Building Blocks, Volume 1.

Originally the University of Guelph was to be represented on the task force for the health sciences, and the recommendations of the task force were to include standards for veterinary medicine at that institution. However, because negotiations between the Ministry of Colleges and Universities and the University of Guelph for suitable standards for veterinary medicine were already in progress, and in view of the number of health science programmes to be examined, the task force agreed to omit veterinary medicine from its considerations.

The members and resource personnel who were involved in the work of this task force are listed in Appendix A. The health science programmes considered and the universities at which they are offered are listed below.

	Medicine	Rehabilitation therapy	Art as applied to medicine	Optometry	Dentistry	Pharmacy	Nursing	Hygiene & Public Health
Lakehead University							x	
Laurentian University							x	
McMaster University	x	x					x	
University of Ottawa	x	x					x	
Queen's University	x	x					x	
University of Toronto	x	x	x		x	x	x	x
University of Western Ontario	x	x			x		x	
University of Windsor							x	
University of Waterloo				x				

The first meeting of the task force was held on October 14, 1971, at which time the general procedures for collecting and analyzing data were considered. These procedures are discussed in the following section. Subsequent meetings were held over a period of months to review the data and work toward the development of recommendations to be presented in this report.

2. PROCEDURES

Before this task force was formed, the Task Force - Space and Utilization had developed a methodology for the derivation of appropriate space standards. A detailed description of this methodology is given in Appendix B. In essence it consists of a scheme for classifying various categories of space, and a set of forms on which each participating university can record and submit its amount of each category of space along with other pertinent information such as student and staff count. From the analysis of these figures, space standards per student, per staff, or other appropriate measures are developed.

In all such studies which proceed from uncertain social policy and which break new ground it is difficult to establish real need. Few needs are absolute needs except at minimum levels. Above these minimum levels need is dependent upon ability to provide. Universities could get along on less space or more space than they have now. But how will the level of service suffer if less space is provided and alternatively, how will it be superfluous to real need if too much space is provided? Funding agencies must look at all expressed needs and then apportion available funds among these needs according to objective criteria and informed subjective judgments. In the task force studies no attempt was made to define real need. Rather, suggested standards were developed in consideration of available space, required space (based upon subjective judgments of the adequacy of available space), and space standards in other jurisdictions.

The space classification scheme is displayed in Appendix C; the reporting forms in Appendix D.

This methodology was considered in the light of certain characteristics of the health sciences that are different in total or in some degree from the non-health sciences. It was decided to follow the established procedures as far as possible and to depart from them only to the extent necessary to meet the requirements of the health sciences. These matters are discussed in more detail in the following sections.

3. COMMENTS ON THE HEALTH SCIENCES

The main characteristics of the health sciences that would require special attention or that would have an effect on the work leading to the development of space standards were recognized from the outset. They are described below.

a. The health science centre concept. The Ontario Health Resources Development Plan has meant the construction, so far, of three health science centres (with an additional three planned) to provide high-quality teaching and referral facilities. Thus education in the health sciences has become increasingly tied to the operation and construction of clinical facilities, pointing to an increased need for cooperative planning between the hospital/university and the various government ministries and agencies.

b. The interface of hospital and university instruction. Most divisions in the health sciences conduct some part of their instruction to students in a hospital setting. In many instances the students are based at the university where they receive most of their instruction, spending only brief periods at a hospital. In other instances they are based at a hospital where they receive virtually all of their instruction, although they also use certain university facilities such as libraries. Instruction may be provided by staff who are permanently based in the hospital, or by staff who provide instruction in both settings. Since the space standards to be developed by the task force were to cover only university space and to exclude space in hospital settings, it was important to identify both the amount of instruction carried out in each setting and the space requirements for it so as to avoid overlap or omission, and unnecessary duplication of facilities.

The importance of this distinction was intensified by the existence of a set of guidelines for the assignment of teaching and research space in teaching hospitals. These guidelines were developed by a task force appointed in 1970 by the Senior Coordinating Committee of the provincial ministries of Health, and Colleges and Universities, and the Ontario Hospital Services Commission. Its purpose was to examine the needs within teaching hospitals for space and facilities in which to provide for clinical training and research and to provide an equitable formula covering these needs. The report of the task force was submitted in March 1971. It introduced a concept for determining space requirements by units. The unit was referred to as a "Z" and the report was referred to as the Z formula. A description of the composition of Z formula space is provided in Appendix E.

In its deliberations this task force omitted from its data the facilities for teaching and research related to clinical instruction, all of which fall within the definition of Z formula space.

c. Z formula space located at universities. In several universities space is occupied and used exclusively by clinical staff who are engaged in activities that are defined and covered by the Z formula. It was necessary to identify this space and exclude it from university space data. When the staff occupying this space are engaged in teaching or research, another factor in the allocation of space is introduced - the shared use of support facilities and services by both basic and clinical staff. It was necessary to prorate this space between the two groups of users, and to exclude the space for which clinical entitlement is generated from university space data. In most instances the proration could be made on the basis of records of usage. The space for a service that was used 50% of the time by each group, for example, would be allocated in equal amounts to university and Z formula space. When records of usage were not available, the proration could be worked out by consultation with the two groups of users.

An example of such space is space for the care and housing of animals. This space was prorated in the manner outlined above, part being charged to and included in university space data and part charged to the Z formula. It is mentioned here to draw attention to the fact that the Z formula does not provide any entitlement for animal space although 30% to 50% of the animal care space is used in support of many clinical research projects. Similarly, there is no entitlement in the Z formula for gymnasia and student activity space. These omissions were noted but compensatory space entitlements were not added to the formula for university space.

d. Clinical service and undergraduate teaching. Some departments, such as pathology and microbiology, are both clinical and non-clinical science departments. They provide both a service to hospitals and instruction to students as part of training in the basic sciences. They may require space in hospitals to discharge part of their service and teaching responsibilities to interns and residents, but they may also hold university space, some of which may be used in support of teaching undergraduates and some in support of research, or clinical service, or both. It was necessary in this situation to identify the use of each type of space held and allocate it according to its use to either university space data or the Z formula by the procedures already mentioned.

e. The changing face of health education. Health education in the province is in a period of adjustment and growth. Some programmes that are now held in a university setting may transfer to a community college, e.g. nursing, although part of the instruction in these programmes may continue to be provided by the universities or teaching hospitals. Students in new or existing programmes at community colleges are expected to receive part of their instruction from the universities. Rising expectations for health care will require increased enrolment in many existing health programmes

at the universities and may require the introduction of entirely new programmes, such as one for assistants to medical doctors. In some instances construction to accommodate new or expanded programmes is completed, or well under way. In others, plans for expansion are being prepared. Innovations in the method of providing health care, as for example by teams of professionals from several health disciplines working both inside and outside hospitals, will undoubtedly influence courses of study. In its deliberations it was necessary for the task force to work toward the development of standards that would reflect space requirements both for existing situations in the health sciences, and for changes of the kind mentioned.

From this background, the space information from the participating universities was analyzed and recommendations were developed and reviewed in relation to the recommendations of the Task Force - Space and Utilization.

Exhibit 1.

POSITION RELATIVE TO RECOMMENDATIONS
OF TASK FORCE - SPACE & UTILIZATION

Category number and name		Appropriate for all programmes including health sciences	Not appropriate for health sciences
5c	Library Service	x	
6	Athletic & Recreational	x	
8	Bookstore	x	
10	Office Space (not elsewhere classified) & Related Areas	x	
11	Academic Services	x	
12	Central Services	x	
13	Services to Students	x	
14	Common Use Space & Student Activity Space	x	
15	Assembly & Exhibition Facilities	x	
1	Classroom Facilities	x	
2	Laboratory (Undergraduate)		x
3	Laboratory (Graduate and Faculty)		x
4	Instructional Staff Offices and Related Space	x	
5a	Library Stack Space	x	
5b	Library Reader (or Study) Area		x
7	Food Service	x	
9	Maintenance & Utility Space	x	

Note: The order of listing of the above categories is the same as in Building Blocks, Volume 1.

Exhibit 2.

RECOMMENDED STANDARDS FOR THE HEALTH SCIENCES

Space Category No.	Name	Input Measure	Standards in NASF: Medicine	Art as Applied to Medicine	Rehabilitation Medicine	Optometry	Dentistry & Dental Hygiene	Pharmacy	Nursing	Hygiene & Public Health
5c	Library Service	FTE-Stud.	3.2	For all						
6	Athletic Recreational	"	10.4							
8	Bookstore, etc.	"	1.8							
10	Office Space (not elsewhere classified) & Related Areas	"	8.9							
11	Academic Services	"	.8							
12	Central Services	"	2.6							
13	Services to Students	"	.3							
14	Common Use Space & Student Acticity Space	"	6.2							
15	Assembly & Exhibition Facilities	"	2.4							
1	Classroom Facilities	SCH 1/	.8-1.0							
2	Laboratory (Undergraduate)	SCH	7.4	7.4	7.4	7.4	7.4	7.4	5.2	7.4
3	Laboratory (Graduate & Faculty)	FTE Faculty 3/	900.0	-	-	175.0	175.0	570	-	570
4	Instructional Staff Offices & Related Space	FTE Faculty	243.0	For all						
5a	Library Stack Space	Equiv. Vols.	.07-.10							
5b	Library Reader (or Study) Area	FTE-UG FTE-G	10.0 10.0	5.5	5.5 10.0	5.5	5.5/10.0 2/	5.5 10.0	5.5 10.0	- 10.0
7	Food Service	FT Stud.	7.5	For all						
9	Maintenance & Utility Space	Gross Area	2%							

1/ A student contact hour (SCH) is one hour of scheduled instruction per student per week.

2/ 5.5 sq. ft. for dental hygiene only.

3/ See pages 13-14 for an explanation of the different space standards for these health sciences.

4. FINDINGS AND RECOMMENDED STANDARDS

The Task Force - Space and Utilization identified seventeen separate categories of space, for each of which a standard was established. Some of these categories refer to facilities that either have common use across the university, such as food services, or have the same space requirements across the university, such as the amount of office and related space for an academic staff member. In all such instances the recommendations of the Task Force - Space and Utilization were accepted. In other instances it was found that the space needs for the health sciences were quantitatively different from other programmes in the university and different recommendations were developed.

It must be emphasized that the formula is applied to calculate the total need for space; the standards derived represent only the average for each category. The range around the average is expected to be large, reflecting a desirable diversity of practices in the utilization of space by universities.

Exhibit 1 lists the seventeen categories of space and shows those for which the space and utilization standards were accepted and those for which other standards are recommended. Exhibit 2 presents the standards that are recommended by this task force for each category of space and for each division of the health sciences.

The proposed standards for categories 2, 3, and 5b were developed from space information that was reported in a uniform manner by each university. For each category of space to be examined, both existing and required space was reported, and in each case the space related to student and staff figures at a given point of time, in most cases December 1, 1971. However, other data were acceptable for required space as long as space, student, and staff figures were of the same date. This was to accommodate both institutions in which space had been constructed and those that had already developed detailed space requirements for a planned increase in student enrolment and staff. With this information at hand, space could be related to the appropriate count of students, or staff, or a combination of the two for each category under study.

The Task Force - Space and Utilization and the Task Force - Space for Education relied mainly on the reported figures of required* space.

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*The Task Force - Space and Utilization asked for two sets of data - the first set to consist of data on <u>available</u> space by category and statistics on the input measures selected for study, and the second set to consist of <u>required</u> space by category based upon best estimates of the space needed at the existing levels of input to eliminate surpluses or deficits. In forming the final recommendations on standards, the task force considered the differences reported between available and required space and made whatever adjustments upward or downward that seemed appropriate for meeting utilization targets.

For some categories these figures reflected a shortage of space and for others an excess for a given population of students and staff and, on balance, were considered to be the most appropriate representation of space needs. This task force adopted the same approach.

A review of the findings and recommendations for undergraduate laboratory space, graduate and faculty laboratory space, and library study space is presented here. A separate comment is made concerning the proposed standard for instructional staff offices, and related space.

a. Category 2 - Laboratory (Undergraduate) Space

> This category includes regularly scheduled laboratory space and associated service facilities. It does not include any laboratory space used primarily for research purposes. A complete description of the space included in this category is presented in Appendix C.

The Task Force - Space and Utilization examined required space for scheduled instruction - classrooms and laboratories - in relation to both student count and average weekly hours of scheduled instruction, which is referred to as student contact hours (SCH). The conclusion reached was that space per student was an unreliable measure because of variations in the amount of each type of instruction students in different disciplines receive. As an example, consider two teaching laboratories of the same size, each designed to accommodate 25 students. One laboratory might be used to provide 5 hours of instruction per week to each of 100 students; the other to provide 2.5 hours per week to each of 200 students. Based on student count, the space per student would be twice as large for the first laboratory as for the second. This inconsistency is overcome by relating space to student contact hours. In the example, the area of each laboratory would relate to 500 SCH (100 x 5; 200 x 2.5).

The task force accepted the conclusion of the Task Force - Space and Utilization and examined this category of space in relation to SCH.

In its report, the Task Force - Space and Utilization recommends the adoption of a standard per SCH for this category of space of 8.5 sq. ft. for agriculture, and 5.2 sq. ft. for other non-health sciences programmes. Examination of the data for health sciences indicated that the standard of 8.5 sq. ft. provided more space than was required for any programme, but the standard of 5.2 sq. ft. did not provide adequate space in any programme except nursing. The average for all health sciences programmes except nursing was found to be 7.4 sq. ft. For nursing the standard of 5.2 sq. ft. is satisfactory.

Like agriculture, although not to the same extent, programmes in the health sciences present a greater need for laboratory space than those in for example chemistry and physics. Some of the factors that dictate this need for greater space are as follows:

1) In addition to other types of teaching laboratories, dentistry (which is excluded from the Z formula) requires large clinical areas for instruction to all levels of students in the practice of dentistry. Although the clinical areas are scheduled for a high level of occupancy, the area per dental chair (or per station), along with support facilities, is large by comparison with station areas in many other disciplines.

2) Most laboratory instruction in the basic health sciences is carried out in small groups in which a demonstrator works with a group of students who are spaced around him to observe the demonstration. This is in contrast to other disciplines where demonstration is carried out at the front of a laboratory before a large group of students. Obviously, more space per station is required for small than for large group instruction.

3) A further reason related to the former one for large station sizes is that laboratory instruction in the basic sciences, to a large extent, involves the use of animals which are the focus of small groups. This is in contrast to fixed or small mobile equipment which requires less space per station than is characteristic of laboratory instruction in many of the non-health sciences.

4) Preparation time between classes in the basic sciences is a time-consuming operation especially where animals are involved. The equipment needed is bulky, varies between disciplines, and must be used in the laboratory near the animals; consequently, the set-up time is considerable and this space cannot be as heavily scheduled as laboratory space in other disciplines.

5) Laboratory space in the basic sciences tends to be specialized, for example the anatomy dissection room. Each type of space has to be provided regardless of its level of usage. The trend toward the use of multi-purpose laboratories is an important factor in the effort to reduce the number of specialty laboratories. The apparent benefits to be derived from their use, however, are diluted to some extent by the preparation time when instruction in one discipline is to be followed by instruction in a different discipline involving extensive changes in equipment and supplies.

6) The nature of laboratory instruction in some health science programmes, such as rehabilitation medicine, calls for large station areas to accommodate various types of equipment associated with both physical and occupational therapy which cannot be made readily available in a shared laboratory.

On the basis of these considerations the task force recommends the following:

a. The standard for medicine, art as applied to medicine, rehabilitation medicine, optometry, dentistry, pharmacy, and hygiene and public health shall be 7.4 sq. ft. per student contact hour.

b. The standard for nursing shall be 5.2 sq. ft. per student contact hour.

b. Category 3 - Laboratory (Graduate and Faculty) Space

This category includes laboratory space generally used for research purposes. Often the laboratory will contain special-purpose equipment. A complete description of this category is to be found in Appendix C.

The Task Force - Space and Utilization examined required research space for the disciplines in the non-health sciences that are involved in laboratory research in relation to various combinations of

a. academic staff

b. graduate students

c. post-doctoral fellows

The conclusion reached was that full-time staff plus FTE graduate students would be a satisfactory proxy for all users of research space in those disciplines. The standard recommended was 210.0 sq. ft. per FT staff and per FTE graduate student.

This task force reviewed these recommendations and found that the proposed input measures were inappropriate for the health sciences on two counts.

First, there is the matter of using a count of graduate students as one of the input measures. To a large extent, research in the health sciences is people-oriented. For each investigator the minimum number of people for research support is constant whether or not these people are graduate students or technicians. For example, if four people are required to support a research project, that number will hold whether it is composed of some graduate students and some technicians, or four technicians and no graduate students. The stable predictor for the space need is the investigator. For this reason the graduate student count should not be used as part of the input measure and some form of academic staff count would be a more appropriate measure of the users of research space.

Secondly, there is the matter of how to express the count of academic staff. Virtually all health-oriented research is centred in universities, and the ability to attract staff who will contribute to the academic excellence and goals of a university often hinges on the opportunity to engage in research. In the basic sciences

most, if not all, staff are involved in research, whether on a full-time or part-time basis. For this reason, the task force concluded that research space should be related to the FTE count of academic staff and that this count is an appropriate measure for all users of research space.

On the strength of these considerations, required research space was examined in relation to FTE faculty. Art as applied to medicine and rehabilitation medicine were shown to have no present requirements for research, and nursing no requirement in the form of laboratory research space. The remaining disciplines could be arranged into three groups, each with a different space requirement per FTE faculty. The average for each group is shown in the following summary.

		Space per FTE faculty
Group A:	Medicine	900 sq. ft.
Group B:	Hygiene & Public Health Pharmacy	570 sq. ft.
Group C:	Dentistry Optometry	175 sq. ft.

At first glance it appears that the requested space per FTE faculty for both groups A and B is excessive both in relation to the standard of 210 sq. ft. recommended by the Task Force - Space and Utilization and to the space recorded for groups B and C. In the health sciences, as already mentioned, research tends to be people-oriented, and the use of FTE faculty as a proxy for all users of this space means that a standard per FTE faculty provides space for all occupants. In relation to a space unit of 210 sq. ft., the indicated standard for medicine provides space for the faculty member and, on the average, slightly more than three other occupants who may be graduate students, or technicians, or a combination of the two. These numbers are well within the range of total occupants per research module in medicine.

Among the reporting universities some disciplines in the non-health sciences have a relatively high graduate enrolment, others a relatively low one. Among these, graduate student to staff ratios may approach 4:1. At such ratios the space per faculty member in a laboratory-oriented discipline will exceed that for a faculty member in a non-clinical health science discipline.

The next consideration is the size of the figure for group A in relation to the figures for groups B and C.

The staff count reported for medicine (group A) excludes all clinicians. The number covers only faculty associated with the basic sciences without regard to department, all of whom are involved in research. At hygiene and public health, only half of the reported staff count are engaged in research, and at pharmacy part-time staff have no significant involvement in research. At dentistry the count of FTE faculty includes clinical staff who are only marginally involved in research if at all.

When the required research space is related only to the staff who are actively engaged in research, the space unit per researcher, excluding optometry, is found to be close to the same size in all disciplines. Research in optometry is of a special nature and the space required for it does not compare with space requirements in other disciplines. Accordingly, it has not been included in the summary.

		Indicated space standard per researcher
Group A:	Medicine	900 sq. ft.
Group B:	Hygiene & Public Health	855 sq. ft.
	Pharmacy	985 sq. ft.
Group C:	Dentistry (Toronto and Western)	850 sq. ft.

There is both an advantage and a disadvantage to this method of expressing research space standards. The advantage is that the space per researcher, within practical limits, is shown to be the same in all disciplines. The disadvantage is that at least one additional, and new, input measure would need to be introduced. For medicine, the input measure would remain FTE faculty. For the other disciplines it would relate to research staff only, and the input would be FT research staff in some instances and FTE research staff in others. Since the end result in terms of space entitlement would be the same whether one or more than one input measure is adopted, the decision rests in favor of the use of the same measure, FTE faculty, for all disciplines.

On the basis of these considerations the task force recommends the following for the disciplines for which laboratory research space has been requested:

a. The standard for medicine shall be 900 sq. ft. per FTE faculty.

b. The standard for hygiene and public health, and for pharmacy, shall be 570 sq. ft. per FTE faculty.

c. The standard for dentistry and for optometry shall be 175 sq. ft. per FTE faculty.

c. Category 5b - Library Reader (or Study) Area

This category includes areas in the library generally referred to as reader or study space. A complete description of the category is included in Appendix C.

The Task Force - Space and Utilization developed space standards for this category from an area per station and the number of stations that would need to be provided to accommodate the student population. The

station size used was 25 sq. ft. It was considered that seating should be provided for 22% of the undergraduate population for an allowance of 5.5 sq. ft. per FTE undergraduate student, and for 40% of the graduate population, or 10.0 sq. ft. per FTE graduate student. The definition of a graduate student was enlarged to include all students in post-first degree programmes such as at the faculty of education.

The task force had no information on relative utilization rates of library study areas by medical students vs. non-medical graduate students, but it is known that undergraduate students in medicine and dentistry make heavy use of campus library reference and study areas. In addition, the campus library facilities are a source of reference for practitioners in medicine and dentistry who participate in continuing education programmes. The operating grants formula weight for medical students is 5, just slightly less than the weight of 6 for Ph.D.'s. By inference this tends to support the need for more library study space than would be required by undergraduate students. It was the view of the task force that the combination of these demands amounted to a space requirement equivalent to that of a graduate student.

On the basis of these considerations the task force recommends the following:

> The standard for undergraduate students in medicine and dentistry shall be 10.0 sq. ft. per FTE student.

d. Category 4 - Instructional Staff Offices and Related Space

> Included in this category are the office and supporting facilities for all academic staff below the rank of dean, including graduate assistants and departmental support staff. A complete description of the space included in this category is to be found in Appendix C.

This task force found that the space standard of 243 sq. ft. per FTE faculty recommended by the Task Force - Space and Utilization for this category in the non-health sciences would be satisfactory for the health sciences. However, it was found that it was not satisfactory for the university as a whole because of the way it provides space for graduate students. A separate report to this effect has been prepared and submitted to the Task Force - Space and Utilization.

5. PRESENT AND FUTURE CONSIDERATIONS

During the meetings of the task force a number of items of importance in the development and application of a capital formula were discussed, some of which have already been referred to, directly or indirectly, in previous sections of the report but are repeated here to emphasize their importance. Others are discussed here for the first time.

a. The section entitled Comments on the Health Sciences included reference to changes in health education. The reference could just as well have been expanded to include all parts of the university for change is the rule rather than the exception. Throughout the university, courses of study are subjected to almost constant review, some to be changed, others to be dropped in favour of new ones. Patterns of instruction change over a period of time. Large group lectures give way to small group seminars. Structured programmes are replaced by an unstructured system in which students are given wide choice in the selection of subjects for study. In the health sciences, instruction by departments is being replaced in some institutions by systems instruction. Diploma programmes become degree programmes by strengthening or lengthening the period of study, or both. Programmes that in the past were firmly entrenched in the university may be transferred in part or in total to community colleges.

   The list of changes that are being made or are under consideration goes beyond those mentioned. In the overall picture, this is good for each change is designed to improve the quality of education. From the standpoint of space entitlement under a capital formula, however, it is important to recognize that changes in the educational process may introduce changes in space requirements. The task forces on space and utilization, and education, have already drawn attention in reports to the need for a periodic review and, where necessary, adjustment of the standards to keep abreast of changes in the educational system. This task force gives full support to these expressions.

b. One element in the structure of the proposed capital formula is that each department in the university generates space entitlement for the instruction it provides regardless of where the students are registered. Within a university this is a satisfactory arrangement. What one department gives up in the way of teaching space where its students receive instruction from another department becomes a credit to the other department without loss of entitlement to the university. To go further afield, a department and the university will also generate space entitlement for the student contact hours of instruction provided to students from outside the university, as for example from the community colleges. However, the structure of the proposed formula does not provide the university with space entitlement for services that, as a matter of course, will be available and no doubt used by students external to the university space, such as food services, common rooms and lounges, library services, etc. The task force recommends that the

review procedures referred to in item (a) above should include a mechanism that will provide additional space entitlement in amounts that will keep pace with the use of these services by such students.

c. Earlier in the report reference was made to university space that is occupied by clinical staff for whom space entitlement exists within the definitions of the Z formula. The space so identified does not form part of the base inventory of the university for capital purposes. However it will age the same as other space and should be eligible for a share of cyclical renewal funds. It is brought to attention here as a matter that merits consideration in the overall distribution of capital funds.

d. Space entitlement under the interim capital formula, which excluded programmes in the health sciences and in education, was developed through a system of programme weightings. In theory at least this is the ideal way to develop and express a capital formula. The space required for each programme can be measured in explicit terms. In practice, however, there are difficulties in this approach because instruction is not provided by programme or by level of student. Undergraduate students in pharmacy for example receive instruction with undergraduate students in arts and science. Departments in the Faculty of Medicine provide instruction to their own students and to other health sciences students as well as to students in the non-health sciences. Mixtures of this kind are common across the university. The development of weightings would involve the distribution of departmental space - classrooms, teaching laboratories, research laboratories, academic offices, etc. - in amounts appropriate to the programmes in which the students receiving the instruction are registered. Some space in the health sciences, for example, would need to be charged to arts and science, and vice versa. This task force shares the view of the others that the structure of the proposed capital formula provides a more accurate reflection of space requirements for individual departments than would come out of an attempt to isolate space and develop weightings by programmes since it is based on the teaching workload of a department regardless of where the students who receive instruction are registered.

e. Space under the Z formula was developed for each Z unit on the basis of a fixed student-staff ratio, and the possibility of using this approach for the health sciences was discussed. The question was reviewed with the Task Force - Space and Utilization to learn what results that group had achieved from their investigation of this approach. The results of their investigation were unsatisfactory. They tried to develop ratios but were unable to arrive at any rational figures. They concluded that staff size in the non-health sciences was effectively controlled through the operating budget. Since the same form of control exists in the health sciences, this task force adopted a similar conclusion to that of the other task force.

f. In its report the Task Force - Space and Utilization presented tables of data to show how total entitlement under the proposed capital formula compared with both entitlement under the interim formula and required space at the five test universities. There were some differences from one set of figures to another but none that appeared to call for major changes in the proposed standards. Since this task force accepted the standards set by the Task Force - Space and Utilization for all but two categories of space, and standards for those two categories are based substantially on required space, it was decided that no further tests of the general structure of the proposed formula are necessary.

APPENDICES

APPENDIX A

MEMBERSHIP

TASK FORCE - SPACE FOR HEALTH SCIENCES

TASK FORCE - SPACE FOR HEALTH SCIENCES

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APPENDIX B

REVIEW OF METHODOLOGY

From

REPORT OF THE TASK FORCE - SPACE AND UTILIZATION

(Pages 9-15)

2. REVIEW OF THE METHODOLOGY

2.1 Procedure

In the Report of the Task Force - Space and Utilization, the reader will have an opportunity to examine a detailed exposition of the assumptions and methodology that we followed. In its approach, it is essentially similar to space allocation formulae used in other jurisdictions outside Ontario. Like the others, there are problems inherent in the approach. In assessing any of these space allocation formulae it is important that the reader be clear in his own mind which of the problems he detects are due to the basic approaches of the formula itself, and which are due to the detailed application of the basic approach to the problems of Ontario universities. For example, the basic problems associated with the use of input measures are inherent in the methodology, while problems of the degree of variation from the selected standards may be the result of application of the method at an inadequate level of detail. In the selection of input measures and standards some form of averaging for the university system is introduced. The data from individual universities will, of course, vary from the averages. This variation can be limited to some degree by the level of detail at which the averaging process is applied, but it would be unrealistic to seek a level considered ideal for every institution.

Most reports on university space allocation give little consideration to the problem of basic approach. Yet we have seen during the course of our study that many of the criticisms one can make of these formulae in reality flow from their original premises. In this section we intend to look briefly at the concepts of space allocation.

Let us begin by recognizing that the Government of Ontario is the primary source of funds for both the Operating and Capital needs of Ontario universities. The various space allocation formulae proposed to them (including this one) are essentially methods of determining the "best" use of these funds in the public interest. The Capital grants problem can be seen as the series of steps set out below.

The Major Steps in Establishing a Capital Grant

1. Determine the "best" level of university plant and equipment for Ontario as a whole.

2. Determine that portion of the above which is best funded by the Government of Ontario, and that which is best funded by the private sector.

3. Determine the "best" allocation of the total funds between the various Ontario universities.

4. Develop a system which creates incentives for each university to make the best use of its capital funds.

Obviously, the critical problem is how one determines what "best" is. Every space allocation formula that we know of - including this one - starts by assuming that one should build a technological relationship between the number of persons or objects housed and the physical plant required to house them. Thus, for example, each Full-Time Equivalent Student is seen to use 'X' square feet of athletic space, bookstore space, classrooms, assembly areas, etc. Similarly, each staff member needs a given number of square feet of office space, and each library book requires a certain amount of space in the stacks.

If one accepts the technological approach, then disagreements involve: (1) what categories of physical plant should be recognized (e.g. how does one define a "classroom"); (2) which measures are to be used as proxies for space demand (the input measurement problem); (3) what conversion factor ought to be used (the space standard). Since this Committee had been instructed to follow an approach that was technological in its basic format, the reader will note that our lengthy deliberations followed essentially this three-step procedure.

However, a system for allocating scarce economic resources (the funds available to support higher education in Ontario) can never be entirely satisfactory if it is based on the technological approach described above. We think it important that the systematic nature of these problems be recognized, since it will help to anticipate some of the problems of implementation, and provide a rationale for recognizing when it is appropriate to up-date the formula.

To begin with, a grant system that separates Operating and Capital grants prevents a given university from effecting economies by making advantageous trade-offs between capital investments and operating costs. For example, it may make good economic sense for a university to rent some of its space instead of building its own. Yet, if it gets "free" capital grants for the building, and has to pay the rent out of its general operating budget, the "rational" decision the university should make seems clear - always build buildings if the capital grant is available. While such a rule presents a gross oversimplification it does illustrate a further dimension to the capital finance problem.

Secondly, the technological approach makes the implicit assumption that the essential methodology of operating a university will remain unchanged over time. That is, it views higher education as a process in which humans sit in rooms of various sizes and talk, experiment and read, within certain defined times of the day. One can reasonably expect this process to shift subtly over time, and a technological formula must have built into it a process for its own modification. For example, only fifteen years ago the demands created

by language departments for laboratory areas would have been grossly underestimated. Even more troublesome, one suspects that over time some functions will need less space, and it is doubtful that the technological approach can readily accommodate this kind of situation.

Finally, it should be recognized that the technological approach is insensitive to the changing cost of scarce resources, and hence does not have its own self-adjusting mechanism to encourage their most efficient use. For example, the cost of handling a book in a library is, at the moment, cheaper than (a) providing a copy of the book to the student to keep for the length of the term, or (b) letting the student retrieve the contents of the book from computer memory and read it on some display device. It is not impossible, however, that the relative cost of these three alternative methods of letting the student do approximately the same thing may shift. For example, it may become cheaper to provide a copy of each book to every student, rather than incur the costs of operating a library for this purpose. In such a case, the space needs of the facility that dispenses books for long loan periods would likely be quite different from the present arrangement.

In case the reader thinks that these cautions are overdrawn - that the basic physical plant relationships for higher education are likely to stay stable over time - let him cast his mind back to 1960, and consider the impact of the following through the ten years to 1970: (a) the rapid growth of computer technology created a demand for additional physical space in addition to the existing conventional classroom and laboratory space, and the universities had to provide this space if they intended to keep teaching and research methods current; (b) the creation of cheap photocopying devices has permitted students to read at home sections of journals and books that they would otherwise have had to read at the library. This may lessen the demand for library reading room space. One could give other illustrations, but hopefully the point has been made - a capital grants scheme based on technological relationships has, by its nature, some inherent problems that cannot be eliminated. While using such a scheme, it is important that one keeps in mind what these inherent problems are. Otherwise, one runs the risk of blaming a specific allocation plan - such as this one - for problems that are common to all.

At this point the reader is entitled to ask why we adopted the technological approach when it seemed to have such obvious faults. The frank answers are (1) the technological approach represents the best alternative as evidenced by its use in other jurisdictions; by using a roughly compatible approach we would be able to make useful cross-comparisons with work done elsewhere; (2) the Province had commissioned a major space study by an outside consulting firm that was known to be using a technological approach, and one of the possible

consequences of our Committee's work might be thoughtful commentary on this study; (3) the preliminary studies prior to this Committee's appointment were based on a technological approach; (4) no better operational approach has been devised.

When the Task Force first met in the summer of 1971 it had three basic tasks to perform. The first of these was to create definitions of physical space categories that would fit all campuses in the system and be exhaustive and mutually exclusive. It was agreed that in every case the amount of space in each category would be measured in square feet. Thus, for any given campus the space allocation scheme we sought to construct would provide both a detailed but not unduly long list of all types of campus physical facilities (.e.g. classroom, recreation, offices), and the number of square feet of each category that a campus "ought" to have. These "outputs" from our system are referred to as space categories.

The next requirement was to decide which physical objects or persons were to be measured as proxies for the various demands on campus physical facilities, and which method was to be used to measure them (e.g. should one simply measure the number of students by counting the number that were enrolled, or make adjustments between those who were full-time and part-time?). These proxies became known as inputs.

Finally, the Task Force had to develop a procedure for selecting the input measure for each category, and determining the appropriate conversion factor. This was the problem of finding space standards. Thus, the basic notion of our space allocation scheme was that we identify and measure inputs, and convert them through standards into space categories as measured in square feet. Any study of this sort is inevitably a learning process, and the Task Force ultimately ended its study with a different perception of the problem from its initial one.

2.2 Space Classification Scheme

In the following paragraphs we shall describe for the reader the assumptions we had prior to our test of the five universities. The reader with a close technical interest in our studies will perhaps disagree with some of our later judgements, and it may be helpful if we indicate our preliminary views of the problem, and how they changed as the result of our tests.

Consider the problem of defining the space categories, since in many ways it proved to be the most manageable. In our opinion, the ideal classification scheme, in addition to providing an exhaustive and mutually exclusive listing of all campus physical facilities, should have the following positive features:

(1) It should be easily extended into a province-wide capital grants formula. This requires us to produce classifications that can be converted into costs per square foot. It is not necessary that every square foot of facility within that classification cost the same, but it is necessary that the average cost for a given facility not vary substantially from campus to campus at a given time.

(2) It should permit an understanding of inter-institutional comparisons. It might also be useful for internal purposes in each university. (We hesitate over this because of the reportedly perverse effects of using the operating grants formula, intended as an inter-university allocation device, for internal allocation within a given campus.) If it is used internally on a campus, the classifications should match the organizational structure of the institution in such a way that sub-organizations within the institution could be encouraged - or forced - by the system to make their own difficult allocation decisions of space within a total overall constraint.

(3) It should be technically "good" in the sense that the classifications chosen should match up naturally with input measures that are readily measurable.

(4) The elements of the system should not have a perverse "steering effect". It is a classic observation in designing control systems that are intended to control some aspect of human behaviour that the person being "controlled" soon learns to get much of what he wants, and he does so with behaviour which is not what the "controller" intended. For example, it is quite clear that the ultimate purpose of a capital grants scheme is to make the most effective use of public funds in the support of higher education. This will not be accomplished if the scheme induces a university to spend funds for a particular kind of space when some other kind would better suit its needs.

A steering effect is most powerful when the grant system reaches down into a given university and dictates what space of each kind must be provided. This has been referred to as the "micro" system of capital grants because it deals with the details of a given building. In contrast, the "macro" system of capital grants is like the present operating grant system, which makes a grant to the institution, and does not, in general, dictate the details of the manner in which it is to be spent.

The classification scheme that this Committee ultimately adopted is described in detail in Appendix C.

2.3 Input Measures

When it came to identifying possible input measures, we decided that the best strategy was to examine a greater number than we would probably want to use, and then to reject those which, in the test, showed themselves to be the least reliable predictors of space use, or which proved difficult to measure. We ultimately decided to try to develop measures for the following:

1. Weekly student contact hours;
2. Semester student contact hours;
3. Number of course registrations;
4. Full-Time Equivalent (FTE) student enrolment;
5. Classified headcount enrolment (graduate);
6. Classified headcount enrolment (undergraduate);
7. Classified full-time faculty;
8. Full-Time Equivalent (FTE) staff (both faculty and departmental support);
9. Equivalent volumes of books;
10. Number of library staff;
11. Total number of full-time staff;
12. Total area of campus buildings, excluding area set aside for central heating and chilling;
13. Full-time Equivalent Administrative Staff;
14. FTE Student Enrolment - in residences;
15. FTE Student Enrolment - not in residences.

The list above shows that in many cases we were trying to measure the same basic object in several different ways. For example, the FTE student measure counts a part-time student as only a fraction of an FTE (the fraction depending on the number of courses he takes), whereas a classified headcount enrolment counts part-time and full-time students as equivalents.

As a result of our testing, many of the above inputs were dropped because we could not find reliable ways of measuring them, or because the evidence failed to show a consistent relationship between the input and the space category under study.

2.4 Space Standards

We turn now to the consideration of standards, or the conversion factors which convert inputs into outputs. There are a number of jurisdictions, particularly in the United States, which have established these standards, and we considered making a detailed examination of these prior to making our own field test, and from these, deriving a tentative set of our own standards for testing. We concluded, however, that a more effective procedure would be for the test universities to provide, on data sheets distributed by the Task Force, all data on available space by category, and statistics on the input measures selected for study by the group. Each test university was also asked to submit a second set of data sheets showing "required space" by category based on its best view of the space needed, at the existing input levels, to eliminate evident excesses or deficiencies. The Task Force felt that existing situations and circumstances were bound to embrace obvious discrepancies from a satisfactory norm, and that the reports on "required space" would be helpful in identifying anomalous situations in existing space allocation and use. A considerable number of excesses and deficiencies were revealed in the reports, and these required intensive examination.

Thus, equipped with a tentative set of inputs, classifications, and a methodology for evaluating proposed standards, the five test universities began their field work. As the information became available, the Task Force proceeded with its analysis and the development of conclusions and recommendations. The Task Force met during the data collection period to resolve uncertainties as to space category and input measure definitions and problems of data availability and measurement. The process of clarification and definition continued through the subsequent data review and analysis period.

APPENDIX C

SPACE CLASSIFICATION SCHEME

(INCLUDING NON-ASSIGNABLE AREAS)

1. CLASSROOM FACILITIES (Lecture, Seminar and Tutorial)

Definition: A room used by classes which do not require specialized equipment for student use or a room which directly serves a classroom as an extension of the activities of the classroom.

Description: Included in this category are rooms generally referred to as lecture rooms, tutorial rooms, seminar rooms, and general purpose classrooms. A Classroom may be equipped with tablet arm chairs (fixed to the floor, joined together in groups, or flexible in arrangement), tables and chairs (as in a seminar room), or similar types of seating. A Classroom may be furnished with special equipment appropriate to a specific area of study if this equipment does not render the room unsuitable for use by classes in other areas of study.

Included in this category are projection rooms, cloak rooms, preparation rooms, closets, storage, and non-scheduled computation rooms if they serve a classroom.

Limitations: This category does NOT include conference rooms, auditoriums, or laboratories. Conference rooms are distinguished from seminar rooms on the basis of primary use; a room with tables and chairs which is used primarily for meetings (as opposed to classes) is a Conference Room. Auditoriums are distinguished from lecture rooms on the basis of primary use; a large room with seating oriented toward some focal point which is used for dramatic or musical productions, or for general meetings is an Assembly Facility (i.e., an auditorium normally used for other than scheduled classes). Laboratories are distinguished from classrooms on the basis of equipment in the room and by its limited use; a room with specialized equipment such as laboratory benches, typewriters, desk calculators, drafting tables, musical equipment, (instructional) shop equipment, etc., which is used for instructional purposes is a Laboratory.

This category does NOT include projection rooms, cloak rooms, preparation rooms, closets, storage, and computation rooms, if such rooms serve laboratories, conference rooms assembly facilities, etc. A projection booth in an auditorium is classified as Assembly Facilities Service.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

lecture-theater	11000
regular classrooms	12000
seminar rooms	13000
service area	17000
computation room	18000
other	19000

2. LABORATORY (undergraduate)

Definition: A room used by classes which require special-purpose equipment for student participation, experimentation, observation, or practice in a field of study, or a room which serves a laboratory as an extension of the activities of the laboratory.

Description: A Laboratory is designed and/or furnished with specialized equipment to serve the needs of a particular area of study for group instruction in regularly scheduled classes. The design and/or equipment in such a room normally precludes its use for other areas of study. Included in this category are rooms generally referred to as teaching laboratories, instructional shops, typing laboratories, drafting rooms, music practice rooms, language laboratories, studios, computation laboratories, laboratory display rooms (including museums and art galleries which serve departments), and similar specially designed and/or equipped rooms IF they are used primarily for group instruction in regularly scheduled classis.

Included in this category are balance rooms, controlled environment rooms, stock rooms, dark rooms, equipment issue rooms, animal holding rooms, greenhouses, computation rooms, service shops (including areas such as machine shops and glass blowing areas which serve a laboratory), and similar facilities which serve a laboratory.

Limitations: This category does NOT include rooms generally referred to as research laboratories. It does NOT include gymnasiums, pools, drill halls, teaching clinics, demonstration houses, and similar facilities which are included under other categories.

This category does NOT include balance rooms, controlled environment rooms, stock rooms, dark rooms, animal holding rooms, greenhouses, computation rooms, service shops etc. which do not serve a Laboratory.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

project space-undergraduate	20430
class laboratories	21000
special class laboratories	22700
large-scale equipment*	23000
small-scale equipment*	24000
suites of facilities*	25000
studios and shops*	26000
service*	27000
demonstration facilities	67000
field service facilities	69000

* that portion which is applicable to Laboratory (undergraduate) space.

3. LABORATORY (Graduate and Faculty)

Definition: A room used for laboratory applications, research, and/or training in research methodology which requires special-purpose equipment for staff and/or student experimentation or observation or a room which directly services a laboratory of this type as an extension of the activities of the laboratory.

Description: Included in this category are rooms generally referred to as research laboratories, or studios and music practice rooms for work at the graduate level.

Also included in this category are balance rooms, controlled environment rooms, stock rooms, dark rooms, animal rooms, greenhouses, laboratory service shops (machine shops, glass blowing), etc. which serve a Laboratory of this type.

Limitations: This category does NOT include rooms generally referred to as teaching laboratories.

This category does NOT include balance rooms, controlled environment rooms, stock rooms, dark rooms, animal rooms, greenhouses, etc., which serve a Laboratory (undergraduate).

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

project space - faculty	20100
- other professional	20200
- research assistant	20410
- other graduate	20420
- technical staff	20500
- other	20900
large-scale equipment*	23000
small-scale equipment*	24000
suites of facilities*	25000
studios and shops*	26000
service*	27000

that directly serve laboratories in this category

4. INSTRUCTIONAL STAFF OFFICES and RELATED SPACE

Definition: A room used by faculty, departmental administrative staff, or students working at a desk (or table) or a room which serves an office (or group of offices) as an extension of the activities in an office.

Description: Included in this category are rooms generally referred to as faculty offices, departmental administrative offices, graduate assistant offices, teaching assistant offices, student offices, etc. Also included in this category is a Studio (music, art, etc.) if such a room serves as an office for a staff member. (A Studio intended to serve a group of students is classified as Class Laboratory (undergraduate)). An Office typically is equipped with one or more desks, chairs, tables, bookcases, and/or filing cabinets.

Included in this category are departmental reading rooms, file rooms, departmental or faculty conference facilities, faculty lounges, mimeograph rooms, vaults, waiting rooms, interview rooms, closets, private toilets, records rooms, and office supply rooms.

Limitations: This category does NOT include rooms which are equipped both as office and "research laboratory". A room equipped with laboratory benches, specialized scientific equipment, and/or such utilities as gas, water, steam, air, etc., is classified as a laboratory. Note that this distinction rests on equipment rather than function. It is recommended that those rooms which have office type equipment and fixed laboratory type equipment (primarily in the biological and physical sciences) within the same room be classified within a laboratory category. Large rooms, such as glass shops, printing shops, reading rooms, research laboratories, etc., which have a desk space for a technician or staff member are classified according to the primary purpose of the room rather than Office.

This category does NOT include centralized mimeograph and printing shops.

TLH CLASSIFICATIONS: The following are the TLH classifications and codes which correspond to this category:

faculty office	31000(except 31100, 31400)
student office	32000(except 32500)
supporting technical (1)	33000(except 33200)
supporting clerical (1)	34000
service (2)	37000
conference (2)	38000
lounge (3)	75000

(1) departmental staff only
(2) serving departmental space
(3) faculty lounges only

5. LIBRARY

(a) STACK SPACE

Definition: A room (or portion of a room) used to provide shelving for books and other library material used by staff and/or students on an individual basis.

Description: Included in this category are rooms generally referred to as library stacks.

Limitations: This category does NOT include book-shelf space in Classrooms, Laboratories, or Offices. Audio-visual film and tape libraries which generally serve groups (rather than individuals) are classified as AV-Radio-TV Facilities. Separate tape storage rooms for language laboratories should be classified as Laboratory Service. Separate rooms containing musical scores, records and tapes are classified as Stack if the primary purpose of the materials is for instruction or research (as in a Library or Music Building). Rooms containing such materials and intended for listening enjoyment (as in a Student Union) should be classified as Student Activity space.

(b) STUDY SPACE

Definition: A room used to study books or audio-visual materials on an individual basis or a room which is a combination of Study Room and Stack, generally without physical boundaries between the stack areas and the study areas.

Description: Included in this category are rooms generally referred to as library reading rooms, carrels, study rooms, individual study stations, study booths, and similar rooms which are intended for general study purposes. Study stations may be grouped (as in a library reading room) or individualized (as in a carrel).

Included in this category are rooms generally referred to as open-stack reading rooms.

Limitations: This category does NOT include Individual Study Laboratories. An Individual Study Laboratory is limited in use to a particular area of study, while a Study Room is intended for general study (or a broad area of study). This category does NOT include Classrooms, Laboratories (undergraduate), Laboratories (graduate and faculty), Research Laboratories, Offices, combined sleeping-study rooms in residence halls or other housing units, waiting rooms or lounges outside the control desk.

(c) LIBRARY SERVICE SPACE

Definition: A room which serves a Reading Room, Stack, or Open-Stack Reading Room as a supporting service to such rooms. A room which directly serves a Library Processing Room as a direct extension of the activities in such a room.

Description: Included in this category are rooms generally referred to as card catalog, circulation desk, bookbinding, microfilm processing, and audio-visual record-playback equipment for distribution to individual study stations. Also included are such areas as closets, locker space, coatrooms, etc.

Offices for library staff, acquisitions work areas, are also to be included in this category. Staff lounges are included if they are inside the control desk.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

library study facilities	40000

6. ATHLETICS and RECREATIONAL ATHLETIC SPACE

Definition: A room (or other indoor area) used by students, staff, or the public for athletic activities. The seating area used by students, staff or the public to watch athletic events. Any room which directly serves an athletic or physical education facility as an extension of the activities in such a facility.

Description: Included in this category are rooms generally referred to as gymnasiums, basketball courts, handball courts, squash courts, wrestling rooms, swimming pools, ice rinks, (indoor), indoor tracks, indoor "fields", fieldhouses, and broadcasting and press box facilities.

Included in this category are rooms generally referred to as locker rooms, shower rooms, coaches rooms, ticket booths, dressing rooms, equipment supply rooms, first aid rooms, skate sharpening rooms, towel rooms, etc.

Included in this category are permanent seating areas in fieldhouses, gymnasiums, and natatoria.

Limitations: No distinction is made on the basis of instructional versus intramural or intercollegiate use of gymnasiums, swimming pools, etc. (Institutions which wish to study the utilization of such facilities will need to further subdivide this category.) This category does NOT include Classrooms or Laboratories, even though they may be located in an Athletic building. It does NOT include outside facilities such as tennis courts, archery ranges, etc.

Offices and office related space which serve directly the athletic facilities are not included here but instead classified in category 10 office space.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

athletic-physical education facilities 50000

7. FOOD SERVICE

Definition: A room used for eating food or which directly serves a Food Facility as an extension of the activities in such a facility.

Description: This category includes dining halls (including those in residences), cafeterias, snack bars, restaurants, and similar eating areas.

This category includes such areas as kitchens, refrigeration rooms, freezers, dishwashing rooms, cafeteria serving areas, and other non-dining areas.

Limitations: This category does NOT include office space and office related space which directly serves food service facilities.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

food facilities	73000
food service space (residences)	91000

8. BOOKSTORE, etcetera

Definition: A room (or group of rooms) used to sell products or services or a room which directly services a merchandising facility as an extension of the activities in that room.

Description: This category includes such rooms as bookstores, barber shops, post offices, dairy stores, laundry rooms, and other merchandising areas.

Included in the category are rooms generally referred to as supply closets, linen rooms, valet service etc. serving this class of facilities.

Limitations: This category does NOT include dining rooms, restaurants, snack bars, and similar Food Facilities. It does NOT include meeting rooms which are classified as Conference Rooms. Mail sorting rooms for university mail are also excluded. Office and office related space serving this category in excluded. Space not included in the Allocation Inventory is also to be excluded from this category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

merchandising facilities	76000

9. MAINTENANCE and UTILITY PLANT

Definition: Space used for the operation and maintenance of the physical plant. This would include a room used for the manufacture or maintenance of products and equipment. A room which directly serves a shop as an extension of the activities in such a room. A room used to store materials. A room which directly serves a storage facility. A room (or structure) used to store or service vehicles.

Description: This category includes such rooms as carpenter shops, plumbing shops, electrical shops, painting shops, and similar trade shops. It also includes central heating and refrigeration, maintenance greenhouses.

Included in this category are tool supply-storage rooms, materials storage rooms, and similar equipment or material supply and/or storage rooms. Locker rooms, shower rooms, lunch rooms, and similar non-public areas should be included.

Classification of a room as a Storage Facility is limited by definition to a central storage facility (warehouse). Storage related to other types of space follow the classification of that type of space with a "service" designation. For example, a storage closet for office supplies is classified as Office Service. The distinction between a "service" classification and "storage" rests on the possibility of physical separation of the materials stored. If the material being stored could be placed in a warehouse, implying only occasional demand for the materials, then Storage Facility is the appropriate classification. Storage which must, by the nature of the materials stored and the demands placed upon them by the program, be close at hand should be classified according to the appropriate "Service" category.

This category includes rooms (or structures) generally referred to as garages, boat houses, airport hangars, and other storage areas for vehicles (broadly defined).

This category includes any area associated with a Vehicle Storage facility which is used for the maintenance and repair of automotive equipment, boats, airplanes, and similar vehicles.

Limitations: This category does NOT include instructional shops; industrial arts and vocational-technical shops used for instruction should be classified as Laboratories. Highly specialized shops for the production of scientific apparatus and equipment should be classified as Laboratory Service. Materials preparation areas in Audio-Visual, Radio Stations, and TV Studios should be classified as Academic Service space.

This category does NOT include portions of barns or similar field-Service Facilities which are used to house farm implements, or parking areas. Offices and office related space serving this category are excluded. Locker rooms, shower rooms, and lunch rooms for custodial staff are non-assignable and therefore are excluded from this category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

non assignable (1)	00000
physical plant maintenance and operations	84000 (except 84200)

(1) central mechanical only

10. OFFICE SPACE (not elsewhere classified) and RELATED SPACE

Definition: A room used by administrative staff (not elsewhere classified) working at a desk (or table) or a room which serves an office (or groups of offices) as an extension of the activities in an office.

Description: Included in this category is all office space not excluded by the limitations.

Included are file rooms, mimeograph rooms, vaults, waiting rooms, interview rooms, closets, private toilets records rooms, office supply rooms, and conference facilities.

Limitations: This category does NOT include centralized mimeograph and printing shops. Academic offices, departmental support staff offices, library offices, student offices and related office space are not included in this category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

professional, other offices	31400
executive office facilities	31100
audio visual offices	33200
support clerical(1)	34000
service	37000
conference	38000
lounge(2)	75000

(1) except departmental
(2) which serves offices - this category.

11. ACADEMIC SERVICES

Definition: A room or group of rooms used in the production and distribution of instructional media or a room which directly serves an A.V. radio or T.V. facility as an extension of the activities in such facilities.

Description: This category includes rooms generally referred to as TV studios, radio studios, sound studios, graphics studios, and similar rooms.

Limitations: Studios used primarily as part of an instructional program to train students in communication techniques should be classified as Laboratories. Offices and office related space serving this category are not classified in this category. Areas for printing instructional media are to be classified in category 12 (Central Services).

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

audio visual	63000

12. CENTRAL SERVICES

Definition: A central facility serving the general need of the university. A room (or group of rooms) for university wide processing of data by machines or computers. A room which directly serves a data processing-computer facility as an extension of the activities of that facility.

Description: This category includes laundry rooms, drying rooms, ironing rooms, etc., located in a Central Laundry. It also includes central printing and duplicating shops, central receiving and central stores.

This category includes keypunch rooms, electronic data processing rooms, electronic computer rooms, and similar data processing areas.

This category includes such rooms as card storage, paper form storage, tape storage, tape storage vaults, control rooms, plugboard storage, wiring rooms, equipment repair rooms, observation rooms, and similar service areas.

Limitations: Laundry rooms, drying rooms, ironing rooms, etc., NOT located in a Central Laundry are classified as Residential Facilities or as a Service facility to whatever type of space they serve.

This category does NOT include rooms containing desk calculators, posting-billing machines, check-writing machines, and similar Office Service rooms. It is recommended that the area occupied by a keypunch machine sorter, or other EDP equipment in a room otherwise classifiable as an Office NOT be assigned to this category. A data processing facility used only for instruction should be classified as a Laboratory. Such a facility used for instruction and/or research and/or administrative data processing should be included in this category. Office and office related space is excluded from this category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

data processing	81000
central stores	84200
shop facilities	82000

13. SERVICES TO STUDENTS

Definition: Facilities provided by the institution to serve the general student population.

Description: Included in this category are such rooms as dispensaries, record rooms, waiting rooms, scrub-up rooms, linen closets, examination rooms, bedrooms, and surgery rooms.

Limitations: Office and office related space is excluded from this category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

clinic facilities	65000

14. COMMON USE SPACE and STUDENT ACTIVITY SPACE

Definition: A room used for recreational purposes. A room used for rest and relaxation. A room which directly serves as an extension of the activities of these facilities.

Description: This category includes such rooms as bowling alleys, pool and billiards rooms, ping pong rooms, ballrooms, chess rooms, card-playing rooms, (non-instructional) music listening rooms, and hobby rooms. Also included are student clubs, student government offices, common rooms, general lounge areas, and general use lockers not directly serving specific rooms.

This category includes storage closets, equipment issue rooms, cashiers desk, and similar areas.

The faculty club lounges and games areas are also to be included in this category.

Limitations: This category does NOT include gymnasiums, basketball courts, handball courts, squash courts, wrestling rooms, swimming pools, ice rinks, indoor tracks, indoor fields, or field houses, which should be classified as Athletic-Physical Education Facilities. It does NOT include outside facilities such as tennis courts, archery ranges, fields (football, hockey, etc.) or golf courses. Departmental lounges are excluded from this category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

lounge facilities(1)	75000
recreation	77000
Student enterprises	32500

(1) serving offices in this category

NOTE: lounges in residences which serve the general student population are included in this category.

15. ASSEMBLY and EXHIBITION FACILITIES

Definition: A room designed and equipped for dramatic, musical or devotional activities. Rooms used for exhibits. Associated service areas.

Description: This category includes rooms generally referred to as theaters, auditoriums, concert halls, chapels, and convocation halls. Seating area, stage, orchestra pit and chancel are also included.

This category includes museums, art galleries, and similar exhibition areas.

This category includes check rooms, coat rooms, ticket booths, dressing rooms, projection booths, property storage, make-up rooms, costume storage, green rooms, control rooms, which serve space in this category.

Limitations: Study collections NOT primarily for general exhibition such as departmental displays of anthropological, botanical, or geological specimens should be classified under an appropriate Laboratory Facility category.

TLH CLASSIFICATION: The following are the TLH classifications and codes which correspond to this category;

assembly facilities	71000
exhibition facilities	72000
chapel	14000

16. NON-ASSIGNABLE AREAS

Non-assignable circulation and service areas whose use classification names and codes as indicated in the latest available OUPRS(1) reports are among the following:

Custodial areas, circulation areas enclosed inaccessible service space public toilets, etc.	01100 - 01200 01340 - 01630

Non-assignable mechanical areas, other than primary or central utilities plants or facilities which are the main source of utilities services to one or more of the various segments of the campus, whose use classification names and codes as indicated in the latest available OUPRS(1) reports are among the following:

Communications service and equipment, refuse areas, heating, ventilation and power	01310 - 01334

(1) OUPRS - Ontario Universities Physical Resources Survey

17. AREAS NOT COVERED BY RECOMMENDATIONS OF THE TASK FORCE

Non-assignable animal areas and field service facilities, that are related to farm operations, whose use classification names and codes as indicated in the latest available OUPRS(1) reports are among the following:

Animal Housing: cages, barns	27610
Animal Feed: bedding, holding	27620
Animal Facilities: cage cleaning	27690
Field service facilities (barns, animal shelters, sheds, silos, field units, hay storage, seed houses, greenhouses)	69000

Non-assignable residential areas whose use classification names and codes as indicated in the latest available OUPRS(1) reports are among the following:

Residential living quarters	92100 - 92390
Housing: managers, supervisors etc.	35100
Matron: housemother	35200

Non-assignable circulation and service areas whose use classificati names and codes as indicated in the latest available OUPRS(1) repor are among the following:

Armory facilities: indoor drill area, rifle range, military science rooms, services, supply, weapons, storage	61100-61770

All areas directly associated with health science programmes.

(1) OUPRS - Ontario Universities Physical Resources Survey

APPENDIX D

DATA COLLECTION FORMS

(FOR BOTH EXISTING AND REQUIRED)

UNIVERSITY _____

UNIVERSITY DATA[1] - SPACE and UTILIZATION

SPACE CLASSIFICATION	TLH CATEGORY	NET ASSIGNABLE SQUARE FEET	STATIONS
Classroom	11000, 12000		
	13000		
	17000,18000,19000		-
Library	41000, 42000,75000[2]		
	43000		-
	30000,44000,45000, 46000,75000		-
Athletics and Recreational Athletic space	50000, 61000[3]		-
Food Service	73000		
	91000		
Bookstore, etcetera	76000[4]		-
Maintenance and Utility Plant	84000[5]		-
	01300[6]		
Office space (not elsewhere classified) and Related space	31100,31400,33000,[7] 34000[8],35000		-
	37000[9],38000[9], 75000[10]		-
Academic services	63000		-
Central services	81000		-
	82000, 84200		-
Service to Students	65000		-
Common use space and student activity space	32500, 75000[10]		-
	61000		-
	75000[11]		-
	77000		
Assembly and exhibition facilities	14000		-
	71000		
	72000		-
Non-formula	-		-

Scheduled weekly hours of operation (classroom facilities)- _____

1. Available data is to be reported as of December 1, 1971. Required data, where it corresponds to planned or new facilities is to be reported as of the date of full utilization.
2. student lounges within control area of the library
3. indoor rifle ranges only
4. note how much of the space is Bookstore proper
5. except 84200
6. central mechanical only
7. except those offices for persons in the position series 2000 and 2300-2400 series
8. except those offices for departmental support staff
9. except space servicing departmental office facilities
10. serving office facilities in this category
11. except those lounges serving offices in categories 4, 5, 10 and 14a.
12. does not have to be reported to Task Force - Health Sciences

UNIVERSITY_____

DEPARTMENTAL DATA[1] - SPACE and UTILIZATION

DEPARTMENT (or DIVISION if necessary)	LABORATORY (UNDERGRADUATE)			LABORATORY (GRADUATE and FACULTY)	
	20430,21000,22700 67000,69000		23000[2],24000[2] 25000[2],26000[2], 27000[2]	20100,20200 20410,20420, 20500,20900	23000[2],24000[2] 25000[2],26000[2] 27000[2]
	SQUARE FEET	STATIONS	SQUARE FEET	SQUARE FEET	SQUARE FEET
UNCLASSIFIED					
TOTAL					

1. Available data is to be reported as of December 1, 1971. Required data, where it corresponds to planned or new facilities is to be reported as of the date of full utilization.
2. which serves laboratories in this category. If it is not possible to prorate this space between laboratory (undergraduate) and laboratory (graduate and faculty) then include all space in these categories under service space for laboratory (undergraduate).

NOTE: all code numbers refer to those used in the Taylor, Lieberfeld and Heldman (TLH) survey.

Scheduled weekly hours of operation (U.G. laboratory facilities) _____

UNIVERSITY_____

DEPARTMENTAL DATA[1] - SPACE and UTILIZATION

DEPARTMENT (or DIVISION if necessary)	OFFICE SPACE							
	ACADEMIC STAFF		STUDENT		DEPARTMENTAL SUPPORT STAFF		SERVICE, CONFERENCE, LOUNGE	
	31000[2]		32000[3]		33000[4], 34000[5]		37000[6], 38000[6], 75000[6]	
	SQUARE FEET	STATIONS	SQUARE FEET	STATIONS	SQUARE FEET	STATIONS	SQUARE FEET	STATIONS
UNCLASSIFIED								
TOTAL								

1. Available data is to be reported as of December 1, 1971. Required data, where it corresponds to planned or new facilities is to be reported as of the date of full utilization.
2. except 31100 and 31400
3. except 32500
4. for persons in the position series 2000 and 3200-2400 series
5. office space for departmental support staff only
6. serving office facilities in this category.

NOTE: all code numbers refer to those used in the Taylor, Lieberfeld and Heldman (TLH) survey.

UNIVERSITY _____

UNIVERSITY DATA[1] - INPUT MEASURES

1. Weekly student contact hours

   - to be reported on the form attached

2. Departmental Data

   - to be reported on the form attached

3. Non-academic (non-teaching) staff

   - headcount of all non-academic (non-teaching) staff from all payrolls for the pay period ending November 30, 1971 and excluding departmental support staff and library staff.

   NUMBER OF PERSONS[2] - _____

4. Library Staff

   - health science library staff in addition to (central) university library staff
   - to be calculated as in section 3 above

   LIBRARY STAFF - _____

5. Equivalent volumes

   - to be calculated for health science libraries in addition to central university library using conversion factors on following page.

   _____

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1. Available data is to be reported as of December 1, 1971. Required data, where it corresponds to planned or new facilities is to be reported as of the date of ull utilization.

2. If possible note number of persons employed temporarily.

CONVERSION FACTORS FOR CALCULATING EQUIVALENT VOLUMES

Material	No. of items	Volume equivalency
Volumes	125	125 volumes
Computer tapes	125	125
Documents, pamphlets Archives	1000 (items)	125
Microfilm (boxed on shelves)	400 (reels)	125
Microfiche, cards etc. (boxed on shelves cards etc)	10,000	125
Newspapers current titles on display	7 (titles)	125
Newspapers unbound back files	7	125
Newspapers bound back files	9 (volumes)	125
Periodicals current titles on display	9 (titles)	125
Periodicals unbound boxed current year	30 (titles)	125
Periodicals boxed back files	included in volume count.	
Phonodiscs - records	500	125
- tapes	500	125
- cassettes	1000	125
Reference	45 (volumes)	125
Slides (filed in a carousel boxed)	75 (carousels)	125
Films	125 films	125
Filmstrips (boxed)	2250 strips	125 volumes

Type of Facility: Vertical files, cabinets, carousels, etc.

Material	No. of items	Volume equivalency
Maps	105	125
Microfilm (reels)	315	125
Micro-cards, fiche, etc.	7900	125
Pamphlets	790 (pamphlets)	125
Slides (in cases)		
Bound	2560 (slides)	125
Unbound	5120 (slides)	125
Filmstrips	580 strips	125
Mounted photos	790 photos	125 volumes

UNIVERSITY_____

DEPARTMENTAL DATA[1] - INPUT MEASURES

DEPARTMENT	FULL-TIME ACADEMIC STAFF[2]	FTE OF PART-TIME ACADEMIC STAFF		DEPARTMENTAL SUPPORT STAFF[5]	FULL-TIME GRADUATES		FTE OF PART-TIME GRADUATE[6]
		PER DUA	"Z" FACTORS[4]		GRAD.	PDF*	
UNCLASSIFIED							
TOTAL							

1. Available data is to be reported as of December 1, 1971. Required data, where it corresponds to planned or new facilities is to be reported as of the date of full utilization.
2. All faculty holding a full time appointment from the president are to be reported in this category (including geographical full-time staff).
3. calculated as per DUA instructions for UA-1 forms (includes graduate and others who teach, and demonstrators).
4. calculated using the "Z" formula factors for full time equivalent (one full-time staff member is the equivalent of two major part-time teachers or four part-time teachers).
5. a headcount of all non-academic (non-teaching) staff from all payrolls for the pay period ending November 30, 1971 and including only departmental support staff (such as technicians, laboratory assistants, markers, animal attendants).
6. calculated as per DUA instructions in the UA-3 reporting forms.

*post-doctoral fellows

STUDENT CONTACT HOURS - LECTURE, SEMINAR, and TUTORIAL

GRADUATE AND UNDERGRADUATE

Teaching Unit

	All non-Health Science Teaching Units								
Dentistry									
Hygiene and Public Health									
Medicine									
Nursing									
Pharmacy									
Physical and Occupational Therapy									
Dental Hygiene									
Public Health Nursing									
Medical Interns and Residents									
Hospital Administration									
All other programmes	———								
TOTALS									

STUDENT CONTACT HOURS

uctions for completing the attached forms:

1. record on each form the student hours taught by each identifiable teaching unit (department, faculty, division or other unit) to each of the programmes listed on the form.

2. the forms should be completed for non-laboratory (lecture, seminar and tutorial) and laboratory teaching.

3. the teaching units identified should match those for which laboratory and office facilities are listed on the other data forms.

4. non-Health Science teaching units include faculties such as Arts and Science and Engineering.

5. student contact hours are to be reported in the following groups:

   i) lecture, seminar and tutorial for graduate and undergraduate students combined.

   ii) laboratory, for undergraduate students corresponding to undergraduate laboratory space reported earlier.

   iii) laboratory, for graduate students corresponding to undergraduate laboratory space reported earlier,

   iv) laboratory, for graduate students corresponding to graduate and faculty laboratory space reported earlier.

STUDENT CONTACT HOURS - LABORATORY

UNDERGRADUATE ONLY

Teaching Unit

	All non-Health Science Teaching Units								
Dentistry									
Hygiene and Public Health									
Medicine									
Nursing									
Pharmacy									
Physical and Occupational Therapy									
Dental Hygiene									
Public Health Nursing									
Medical Interns and Residents									
Hospital Administration									
All other programmes									
TOTALS									

STUDENT CONTACT HOURS - LABORATORY
GRADUATE CONTACT HOURS TAKEN IN UNDERGRADUATE FACILITIES

Teaching Unit

	All non-Health Science Teaching Units								
Dentistry									
Hygiene and Public Health									
Medicine									
Nursing									
Pharmacy									
Physical and Occupational Therapy									
Dental Hygiene									
Public Health Nursing									
Medical Interns and Residents									
Hospital Administration									
All other programmes									
TOTALS									

STUDENT CONTACT HOURS - LABORATORY

GRADUATE CONTACT HOURS TAKEN IN GRADUATE AND FACULTY FACILITIES

Teaching Unit

	All non-Health Science Teaching Units								
Dentistry									
Hygiene and Public Health									
Medicine									
Nursing									
Pharmacy									
Physical and Occupational Therapy									
Dental Hygiene									
Public Health Nursing									
Medical Interns and Residents									
Hospital Administration									
All other programmes									
TOTALS									

APPENDIX E

"Z" FORMULA

1. DEFINITIONS

(1) Teaching Hospitals

Four types of teaching hospitals are defined as follows:-

(a) A University Hospital is one in which the entire services are committed to clinical teaching units, services and division functions.

(b) A Principal Teaching Hospital is one which the university has designated, with institutional agreement, to serve a function equivalent to a University Hospital.

(c) An Affiliated Teaching Hospital is one which is affiliated by institutional agreement to fulfil university objectives in patient care, teaching and research in one or more clinical teaching units, divisions or services.

(d) An Associated Teaching Hospital is one which has an agreement for a limited program related to university objectives.

(2) Primary Physician

Primary physicians are of two types:

(a) A physician who provides care to persons of all ages, usually whole families, to be directly available to them at all times for any health problem and to accept a continuing responsibility for their health maintenance and medical care.

(b) A physician who provides care to persons of one age and/or sex group to be directly available to them at all times for any health problem and to accept continuing responsibility for their health maintenance and medical care (e.g. paediatrician, internist, obstetrician).

(3) University Health Sciences Centre - is the health sciences development on campus and related developments, including teaching hospitals.

(4) Health Sciences Complex - is the total unit composed of the university health sciences centre, colleges of applied arts and technology and other institutions involved in the production of health manpower within the sphere of influence of a particular centre.

(5) GFT (Geographic Full-Time or Equivalent)

GFT = 1 Full-time clinical teacher, or
2 Major part-time clinical teachers, or
4 Part-time clinical teachers.

1. DEFINITIONS (continued)

(6) Clinical Teaching Unit

A Clinical Teaching Unit, Service or Division, which may be an entire hospital or a designated hospital area, is one which provides opportunity for under-graduate and graduate medical education (not limited to the intern year) under the auspices of a faculty of medicine of a Canadian university.

The medical staff of a Clinical Teaching Unit, Service or Division is appointed jointly by the university and the hospital. The medical care of the patient in a teaching unit, service or division is the function of the team of staff, physician, resident, intern and clinical clerk, based on the principle of graded responsibility commensurate with the competence and level of training. The staff is organized in departments, the heads of which are also appointed jointly by the university and hospital.

In the teaching unit all the resources of the staff are brought to bear on the problems of each patient. The staff has the double responsibility of caring for the patient and teaching the student. Exemplary treatment of the patient would always result. The unit provides the most stimulating setting for clinical research and for the assessment of new methods of treatment. The total number of Clinical Teaching Unit beds available at all times for clinical teaching should be a minimum of ten active treatment patients for each final year student. If the teaching beds contain long stay patients, a significantly larger number will be required.

The clinic for ambulatory patients provides an opportunity for teaching experience under conditions which resemble practices in the home or office. Such clinics should be organized and supported to provide comprehensive medical care. They should be staffed by physicians holding university appointments. For effective teaching there should be at least one new admission per diem for each student during his period of instruction in the clinic.

The decision as to whether a unit, service or division in a hospital should be considered as a teaching unit must be the responsibility of the university concerned.

(Definition: Association of Canadian Medical Colleges)

2. INDICES

(1) The "Z" Unit has been devised as a standard unit to carry the educational and research component for:

(a) In medicine - one final year clinical clerk, the clinical teaching of 1/3 of the time of a second year and 2/3 of the time of a third year undergraduate student, 1 first year "intern", 3.5 postgraduate residents, including family practice, and .5 physician on continuing education programs.

(b) In other health professions - those who receive their clinical training in a teaching hospital.

For purposes of entitlement, a figure equivalent to the stated objective of the number of students graduating in medicine has been taken as a base for relating the needs of undergraduates and postgraduates in teaching hospitals. The allocations, as currently understood, are:-

University of Toronto	250 "Z"
University of Western Ontario, London	100 "Z"
University of Ottawa	96 "Z"
Queen's University, Kingston	75 "Z"
McMaster University, Hamilton	64 "Z"

(2) Each "Z" will require a minimum of 10 designated active treatment teaching "beds".

(3) (a) Primary care physicians (type (a) above), including the specialty of family medicine, are calculated to require an average of 2.5 years of training post M.D.

(b) Other specialists are calculated to require an average of 4.5 years of training post M.D.

(4) (a) i. GFT/E Clinical Teaching Staff is calculated in the ratio of 1:5 of all medical students, residents and continuing education students in the program. This yields 1.8 GFT/E per "Z".

ii. GFT/E Clinical Instructors for other health personnel are calculated in the ratio of 1:10.

(b) Full-time Clinical Researchers are calculated as 1:10 GFT/E Staff.

(5) The ratio of 2:3 for conversion of net square feet to gross square feet overall was adopted.

3. SCHEDULES

It is proposed that capital funding for the different types of teaching hospitals be based on the appropriate "mix" determined by the university and planned jointly with the appropriate hospital in accordance with the following schedules.

(1) Schedule "A"

Includes teaching and research space required in any University, Principal or Affiliated Teaching Hospital, over and above the requirements of a non-teaching hospital of similar size or complexity. The following items should be included as 100% coverable from O.H.R.D.P. funds.

LECTURE THEATRES AND AUDITORIA (Appendix Note 1)		140 sq. ft. per "Z"
LEARNING RESOURCES (Appendix Note 2)	Library and Audio-Visual	100 sq. ft. per "Z"
STUDENT AMENITIES (Appendix Note 3)	Locker, lounge and related space	170 sq. ft. per "Z"
IN-PATIENT SPACE (Appendix Note 4)	On Nursing Units	300 sq. ft. per "Z"
	On Non-Nursing Units	108 sq. ft. per "Z"
	On-Call Rooms for Clerks and Residents	80 sq. ft. per "Z"
OFFICES, SECRETARIAL ACCOMMODATION FOR TEACHING STAFF (Appendix Note 5)		535 sq. ft. per "Z"
AMBULATORY CARE AREAS (Appendix Note 6)		465 sq. ft. per "Z"
FAMILY PRACTICE (Appendix Note 7)		250 sq. ft. per "Z"
CLINICAL RESEARCH FACILITIES (Appendix Note 8)		652 sq. ft. per "Z"
SUPPLEMENT for increased loading on diagnostic treatment and support services of hospital by virtue of designated teaching beds. (Appendix Note 9)		1000 sq. ft. per "Z"

It is emphasized that the total space per "Z" Unit is not the sum total of the individual allocations listed above. Effective integration of programs, phasing of use and pooling of arrangements would lead to a substantial reduction in the total. Therefore it is considered that the total space assigned per "Z" Unit can be reduced by about 15% - that is from 3820 sq. ft. (which is the sum total of the above) to approximately 3250 sq. ft. The individual plans will be studied to determine that effective utilization is being achieved in each of the individual projects. In addition, the Senior Co-ordinating Committee has an indication that larger numbers of students can be educated within the allocations of space than have previously been indicated.

3. SCHEDULES (continued)

(1) Schedule "A" (continued)

In some cases a hospital may delegate certain of its functions to others, hence the designation of each component's spatial allocation. For example:

(a) A number of adjacent teaching hospitals may combine their space for auditoria, audio-visual facilities, library and student amenities into a combined "learning centre".

(b) A hospital or a group of hospitals may allocate some clinical research space in an adjacent "basic sciences" building.

(c) Primary care teaching units may be separately built and administered either in association with or separate from the hospital.

(d) A hospital may be proportionately more utilized for ambulatory care teaching and not require the same in-patient increment or vice-versa.

(2) Schedule "B"

In the case of university or principal teaching hospitals, O.H.R.D.P. funds may be allocated for capital construction of hospital bed facilities. Allocations of funds under this Schedule can be based on square feet per bed for average community hospital services -

namely 5000 net square feet per "Z".

The additional space requirements for increments to diagnostic and treatment facilities in a university hospital and the specific space requirements for offices, research and ambulatory care will be provided by appropriate Schedule "A" allocations.

(3) Schedule "C"

O.H.R.D.P. funds may be utilized to provide the capital construction and equipment costs, in whole or in part, in principal, affiliated or associated teaching hospitals.

(i) For highly specialized units; to serve patient care, teaching and/or research at least one of which is required within the regional sphere of influence of the health sciences centre. Funding should be 100% of the teaching and research component and by mutual agreement between the university and the hospital up to 100% of the patient care component. (Highly specialized services are defined by the Ontario Council of Health as "A diagnostic or therapeutic facility often directed toward one organ or disease, requiring a high level of professional expertise and or sophisticated equipment not essential in each hospital but essential within regions of the Province".)

It is not possible to formulate standardized funding in accordance with "Z" Units for this Schedule since many relate to sophisticated patient care facilities. It is recommended that each complex identify and specify a certain percentage of the apportionment to be utilized and divided amongst its teaching hospitals for this purpose.

3. SCHEDULES (continued)

(3) Schedule "C" (continued)

(ii) It is recognized that there may be unique provincial resources and that by common agreement amongst the five centres they will be located at an individual centre for the service of the Province. The funding in these circumstances is a matter which would need to be the subject of further review.

4. APPLICATION

The indices which have been developed are intended to assist in the development of adequate facilities for teaching, research and related services in the teaching hospitals in each of the five health sciences complexes. These guides are to provide a means by which the overall capital allocation to each complex may be distributed on an equitable basis to the institutions participating in the teaching and research program.

The following statements will attempt to define, in general terms, the responsibilities of the university, the teaching hospitals, the colleges of applied arts and technology and other educational institutions.

(a) Universities

Each university has the responsibility to initiate, co-ordinate and maintain programs of teaching and research within the health sciences complex. The university has the responsibility to determine the non-clinical facilities required for academic programs in the health sciences and, in association with other co-ordinating organizations, will define the amount of and type of teaching and research in the integrated program, establish the teaching and research role of each teaching hospital and then indicate on the basis of the indices the maximum amount of capital funds which may be available to each institution. It is anticipated that the maximum allocation established through the use of the indices will be adjusted to take into account existing space which need not be renovated or re-constructed. The university will also be responsible for indicating priorities for programs and expenditures so that annual capital cash flow requirements may be determined.

(b) Teaching Hospitals

The teaching hospitals will utilize their entitlement of teaching and research capital funds to develop those plans which reflect their established role and program requirements and within the restraint of available capital funds.

It is the responsibility of the teaching hospitals to ensure that the requirements for teaching and research are co-ordinated with those (as identified by agencies such as Planning Councils) for service. When needs have been defined for the three areas - teaching, research and service - it is then the responsibility of the teaching hospitals to develop plans by which they are translated into facilities in a logical and phased fashion in keeping with available resources.

4. APPLICATION (continued)

(c) Colleges of Applied Arts and Technology and Other Educational Institutions

The place of the colleges of applied arts and technology and other educational institutions which are functionally affiliated with the health sciences complexes should be defined, along with their requirements for teaching space in the hospitals.

(d) Provincial Departments and Agencies

Channels of communication between the universities, teaching hospitals, colleges of applied arts and technology and other educational institutions would follow the normal pattern. Communications between the health sciences complex co-ordinating group should be between the Chairman of that group and the Chairman of the Senior Co-ordinating Committee.

SPACE RATIONALE

1. LECTURE THEATRES AND AUDITORIA (140 sq. ft. per "Z")

Although 15 net square feet per student has been the generally agreed figure for the design of individual lecture theatres, on a complex wide basis the Department of University Affairs recommends an allowance of 9 to 11 sq. ft. per student, based on 30 hours of use per week at 67% utilization. Larger space generally will require smaller per student allowance, therefore, at 10 sq. ft. per student, each "Z" will generate 140 sq. ft

2. LEARNING RESOURCES (100 sq. ft. per "Z")

All teaching hospitals having a significant teaching role should have a library in the hospital for the use of medical students. The size of the library would be related to the size of the hospital and the proximity of other library services such as those in the Medical Sciences Building. A reasonable estimate of the space which should be assigned for hospital library purposes would be 50 sq ft. per "Z" for undergraduate students and 25 net sq. ft per "Z" for post-graduate students.

The teaching hospitals will develop space to accommodate audio-visual services - medical photography and medical illustration. In the teaching hospital television will be used for teaching purposes. Provision of extensive television facilities can involve large expenditures on space, wiring, television monitors and cameras. The basic requirement will be a location where television programs for teaching can be initiated and this could involve development of a television "studio". Such a "studio" would require a minimum of about 1200 sq. ft. and if this space is related to 600 beds in clinical teaching units, the space requirement becomes 20 net sq. ft. per "Z".

To permit extension of a television system into other areas of the hospital and especially the operating room, will require additional space which could be met by a further 5 net sq. ft. per "Z". The total estimated space requirement for television as an audio-visual facility therefore becomes 25 net square feet per "Z".

3. STUDENT AMENITIES (170 sq. ft. per "Z")

Since teaching hospitals must provide clinical instruction to a range of health professional students it was felt the total capacity must be related to all the students assigned from all health educational institutions at one time.

Each final year medical student will require a locker because he will be working full time. Each post-graduate clinical student would require a locker Since the average duration of training is 3.5 years, there is need for 3.5 spaces for post-graduates. One locker is required for the first year "intern". One locker between each second and third year medical student would be sufficient and .5 locker is required for the .5 physician on continuing education Therefore 7 lockers are required for medical personnel and 7 lockers for non-medical personnel are felt

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3. STUDENT AMENITIES (continued)

to be sufficient. This would amount to 14 lockers per "Z". Allowing the same proportion of usage for lounge and related space and allowing 12 sq. ft for student amenities, 14 x 12 sq. ft. would amount to 168 net sq. ft per "Z" which should be rounded to 170 net sq. ft. per "Z".

4. IN-PATIENT SPACE (488 sq. ft. per "Z")

On Nursing Units: (300 sq. ft.)

Seminar Rooms - A room which can be used for conferences and demonstration purposes and is suitably furnished and equipped for such purposes should be provided in support of each 30 beds allocated to clinical teaching units. Some economy in space may be achieved where the self-contained clinical teaching unit has more than 30 beds. The space should be planned to allow three rooms of 350 sq. ft each for every 60 beds, which amounts to 175 sq. ft per "Z".

Student Laboratories - A laboratory in which simple procedures can be carried out is required for use by students in Clinical Teaching Units. Adequate space would be available in a laboratory of 90 sq. ft which could service at least 60 beds. If laboratories were provided for all clinical teaching units, the requirement would become 15 net sq. ft. per "Z" but a more realistic figure would be 10 net sq. ft. since all units would not require student laboratories.

Consultation Rooms - Each 30 beds in clinical teaching units should be supported by two consultation rooms each of 120 sq. ft. These rooms would be available for consulting with patients and relatives as support for the under-graduate teaching program but could also be used by social service, dietary, clergy, etc. when available. Provision of this space would result in an assignment of about 80 net square feet per "Z".

Medical Students' Rooms - A room should be provided on the basis of one room for every 60 beds in clinical teaching units. The room would act as a study and conference room and as a lounge for medical students assigned to the clinical teaching unit and should provide a minimum of 200 sq. ft. of space. Some economy could be gained with clinical teaching units larger than 60 beds. On the above assignment related to 60 beds, the requirement per "Z" for this purpose would be 35 sq. ft., rounded.

On Non-Nursing Units: (108 sq. ft.)

It is estimated that the following space is required:

Intensive Care Units, Coronary Care Units and Anaesthesia:
5 rooms for residents (520 sq. ft.) and 1 conference room (200 sq. ft.)
Delivery Suite: 1 conference room (200 sq. ft.)
Operating Theatre: 1 conference room (200 sq. ft.)
Rehabilitation Medicine: 1 conference room (200 sq. ft.)

4. IN-PATIENT SPACE (continued)

On Non-Nursing Units: (continued)

Emergency Room: 1 room for residents (100 sq. ft.)
Clinical Laboratories: 10 rooms for residents (1000 sq. ft.) and 1 conference room (350 sq. ft.)
Dialysis Unit: 1 room for resident (100 sq. ft.)
Diagnostic Radiology: 6 rooms for residents (600 sq. ft.) and library and conference room (400 sq. ft.)
Therapeutic Radiology: 2 residents (200 sq. ft.) and library and conference room (250 sq. ft.)

Total space for residents and conference rooms 4320 sq. ft.
Based on 400 beds in clinical teaching units, or 40 "Z"s, the space per "Z" amounts to 108 sq. ft.

On-Call Rooms for Clerks and Residents (80 sq. ft.)

On-call rooms are considered as requiring 80 sq. ft. per room plus an allowance of 20 sq. ft. per room for washrooms, etc. for a total of 100 sq ft. per room. The number required was considered to be accommodation on the nursing units for one undergraduate plus one post-graduate in relation to every 30 beds, or 66 sq. ft. per "Z". In addition, such specialized units as Intensive Care, Emergency, Anaesthesia, will require overnight accommodation. Since the allocation will be divided between at least two hospitals and two people will be needed in each of the units, an allocation of 15 rooms for every 100 "Z"s is considered reasonable. The total requirement is therefore 66 + 15, or 80 sq. ft. per "Z", rounded.

5. OFFICES, SECRETARIAL ACCOMMODATION FOR TEACHING STAFF (555 sq. ft. per "Z")

Offices for GFT/E - Medical (465 sq. ft.)
It is estimated that 300 sq. ft. per GFT/E is required. Teaching ambulatory care facilities, waiting rooms, examining rooms, record rooms, are over and above these units although they may be located adjacent and are included in ambulatory care specialty space The understanding was that an office that would serve a full "FT" would be made to serve two major part-time or four or more part-time. To arrive at the amount of space per "Z" the figure of 300 sq. ft. should be multiplied by 1.8 which would amount to 540 sq. ft. From this should be subtracted 75 sq. ft. for those people in Family Practice Units for whom accommodation has been provided elsewhere. This amounts to 465 sq. ft. per "Z".

Other Health Professional Instructors (45 sq. ft.)
An allocation of 45 sq. ft. is made for clinical instructors other than medical, who do not normally have a "service office" in the hospital or an office at a nearby educational facility. Included are 100 sq. ft. per instructor's office and 20 sq. ft. for secretarial space and it is considered there would be one clinical instructor per 10 students - of which one half would require a teaching office in the hospital.

5. OFFICES, SECRETARIAL ACCOMMODATION FOR TEACHING STAFF (continued)

Space Supplement for Departmental Chairs (45 sq. ft.)
The departmental headquarters of a university clinical department whether or not they are located in a teaching hospital, are considered to require some additional space for secretarial, records, departmental libraries, etc. The additional space required per department is 360 sq. ft. and the number of departments is calculated as one per eight "Z"s. This equals 45 sq. ft. per "Z".

6. AMBULATORY CARE AREAS (465 sq. ft. per "Z")

Examining Rooms (150 sq. ft.)
The basic teaching unit in an out-patient department is the examining room and there is general agreement that this room should be sized to support a teaching function and a space allocation of 75 sq. ft. is considered reasonable. Two would be required per "Z".

Consulting Room (150 sq. ft.)
Consulting rooms should be planned on the basis of one for each two examining rooms and should contain 150 sq. ft. of space.

Seminar Space (20 sq. ft.)
The requirement is one room of 200 sq. ft. for 10 examining rooms which equals 20 sq. ft. per "Z".

Study Carrels (20 sq. ft.)
Two rooms of 100 sq. ft. each are required for 10 examining rooms which amounts to 20 sq. ft. per "Z".

Reception, Waiting, Nursing and Support Space (125 sq. ft.)
This space includes patient waiting area and washrooms, registration and appointment office, office for nurses, utility rooms, interview areas, dictation space, records, storage, etc.

7. FAMILY PRACTICE (250 sq. ft.per "Z")

The development of out-patient or ambulatory patient facilities related to family practice or primary care units, as physical entities, is of recent occurrence in Ontario. Aside from providing a practice setting for a family physician or a number of family physicians, the units are designed to carry on a teaching program for medical undergraduates to acquaint them with family practice and to interest them in entering such practice on graduation.

An additional, and increasingly important, function of the units is to plan and carry out a graduate training program of two or three years' duration designed to train physicians for entry into family practice and as primary care physicians. Another function of the units is to carry on research related broadly to the field of family practice and the provision of primary medical care.

The units which are operational or in the planning stages are all teaching components of medical faculties with their medical staffs holding full-time or part-time teaching appointments and are developing into three types:

7. FAMILY PRACTICE (continued)

(a) Physically and functionally as part of a teaching hospital - the most common type to date.

(b) Closely related to a teaching hospital but not physically part of it - the so-called "Medical Centre" development.

(c) Having a "home base" relationship to a teaching hospital but being developed as a "Medical Centre" in a rural setting often a considerable distance from a teaching hospital.

With the emphasis on post-graduate family practice training and its introduction into many clerkship programs, one GFT clinical teacher in this field will be required per 4 "Z". It is assumed that GFT clinical teachers in this field will be engaged in groups of 4-5 in their teaching clinics. Included in this space are:

Teaching Physicians' Office	150 sq. ft.
Examining Rooms	300 sq. ft.
Secretarial, Records and Waiting Space	325 sq. ft.
Working Rooms, Residents and Clerks	125 sq. ft.
Other Health Professions	100 sq. ft.
	1000 sq. ft.

Conference rooms, research space, would be allocated from the pool designated for these purposes elsewhere. Thus the figure of 250 net sq. ft. per "Z" is arrived at.

8. CLINICAL RESEARCH FACILITIES (652 sq. ft. per "Z")

The following formula was used:

The ratio of GFT/E clinical teachers to FT clinical investigators is based on 10:1. Of 99 FT staff, one in ten (or 9 of 99) would be FT clinical investigators and are estimated to require 1200 sq. ft. of space each	9 x 1200 =	10,800 sq. ft.
Of the remaining 90, one third (or 30) would be engaged up to 50% of their time in clinical research activity and are estimated to require 525 sq. ft.	30 x 525 =	15,750 sq. ft.
The second third (or 30) would be involved in office type research, using computers, libraries, etc. and are estimated to require 200 sq. ft.	30 x 200 =	6,000 sq. ft.
The remaining third would not have a great involvement and would require no clinical research space.		
Space required by 90 FT staff, plus clinical investigators		32,550 sq. ft.
To arrive at space per FT, divide by 90		362 sq. ft.
To arrive at space for GFT/E per "Z", multiply by 1.8		652 sq. ft.

9. SUPPLEMENT (1000 sq. ft. per "Z")

There is an increased space demand in a teaching hospital to provide for the increased use of diagnostic and treatment services and upon the general service and support areas of housekeeping, etc., by the increased volume of staff and students housed in the hospital. It is estimated that this increase is about 20%, according to a number of independent sources. This increased requirement should be assignable to O.H.R.D.P. funding, even when the basic costs of beds were supported by other capital financing means and should be applicable to the number of "Z"s assigned to any teaching hospital.

Ten beds per "Z" have been accepted as an index and the average space requirement per bed in comparable community hospitals is 500 net sq. ft. The supplement is therefore calculated to be 1000 net sq. ft. per "Z".

10. BASIC SPACE REQUIREMENT PER BED

On information received from various sources the basic space requirement for provision of adequate community hospital services is estimated to be 500 net sq. ft. per bed. In the case of principal or university hospitals, at 10 beds per "Z", the total space requirements are 5,000 net sq. ft. per "Z".